

Claims:

1. A UV radiation curable clearcoat coating composition comprising at least one compound selected from A) and B) wherein
 - A) comprises 0.1% to 99.9% by weight of one or more compounds selected from the group consisting of acrylate and methacrylate monomers having from 1 to 6 free-radically polymerizable groups per molecule and mixtures thereof ;
 - B) comprises 0.1 to 99.9% by weight of one or more compounds containing two or more ethylenically unsaturated, free radically polymerizable groups per molecule selected from the group consisting of urethane acrylates and methacrylates, polyester acrylates and methacrylates, melamine, acrylic amine, cellulose based acrylates and methacrylates and unsaturated polyesters and mixtures thereof;
 and further comprising
 - C) from 0.1 to 10.0 % by weight of one or more photoinitiators; and
 - D) from 0 to 70% of compounds selected from the group consisting of solvents,
 - E) from 1 to 15% of compounds selected from the group consisting of photosynergists, ultraviolet absorbers, hindered amine light stabilizers, adhesion promoters, flow aids, wetting aids, rheology modifiers and mixtures thereof.
2. A UV radiation curable clearcoat coating composition according to claim 1 wherein the compound A is selected from the group consisting of octyl-decyl monoacrylate, isobornyl monoacrylate, isodecyl monoacrylate, hexanediol diacrylate, tripropyleneglycol diacrylate, trimethylolpropane triacrylate, alkoxylated trimethylolpropane triacrylate, pentaerythritol triacrylate, pentaerythritol tetraacrylate pentaerythritol pentaacrylate, dipentaerythritol hexaacrylate, and mixtures thereof above.

3. A UV radiation curable clearcoat coating composition according to claim 1 wherein compound B is selected from the group consisting of urethane acrylates, polyester acrylates and methacrylates, melamine, acrylic amine, cellulose based acrylates and methacrylates and unsaturated polyesters and mixtures thereof.
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4. A UV radiation curable clearcoat composition according to claim 1 comprising compound A) in an amount from 1 to 50% by weight, compound B) in an amount from 30 to 80% by weight, and D) 20-50% by weight of volatile organic solvent.
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5. A UV radiation curable clearcoat composition according to claim 1 wherein contains one or more photoinitiators curable by radical polymerization.
- 15 6. A UV radiation curable clearcoat coating composition according to claim 1 wherein the coating is cured with an irradiance level between .01 and 200mW/cm² for a time of between 1 second and 30 minutes to obtain a non-tacky surface.
- 20 7. A UV radiation curable clearcoat coating composition according to claim 1 wherein the coating is cured with an irradiance level of between 1 and 100 mW/cm² for a time of between 30 seconds and 10 minutes to obtain a non-tacky surface.
- 25 8. A UV curable clear coating composition according to claim 6 or 7 wherein the coating is cured with a UV source providing UV irradiation with UVV:UVA of 1:1 or less, UVB:UVA of 1:1 or less, and UVC:UVA of 1:1 or less.
- 30 9. A UV curable clear coating composition according to claim 6 or 7 wherein the coating is cured with a UV source providing UV irradiation with

UVV:UVA of 1:1 or less, UVB:UVA of 1:1 or less, and with substantially no UVC.

10. A UV curable clear coating composition according to claim 6 or 7 wherein
5 the coating is cured with a UV source providing UV irradiation with
UVV:UVA of 0.5:1 or less, UVB:UVA of 0.5:1 or less, and with
substantially no UVC.
11. A UV curable clear coating composition according to claim 6 or 7 wherein
10 the coating is cured with a UV source providing UV irradiation with
UVV:UVA of 1:1 or less, and with substantially no UVB and UVC.
12. A UV curable clear coating composition according to claim 6 or 7 wherein
the coating is cured with a UV source providing UV irradiation with UVA
15 only, and with substantially no UVV, UVB, and UVC.
13. A process for applying a clearcoat coating composition to a substrate
comprising
- I) providing a substrate having at least one coating thereon;
- 20 II) applying to the substrate a clearcoat composition comprising at least
one compound selected from A) and B) wherein
- A) comprises 0.1% to 99.9% by weight of one or more
compounds selected from the group consisting of acrylate
and methacrylate monomers having from 1 to 6 free-radically
25 polymerizable groups per molecule and mixtures thereof;
- B) comprises 0.1 to 99.9% by weight of one or more compounds
containing two or more ethylenically unsaturated, free
radically polymerizable groups per molecule selected from
the group consisting of urethane acrylates and methacrylates,
30 polyester acrylates and methacrylates, melamine, acrylic
amine, cellulose based acrylates and methacrylates and
unsaturated polyesters and mixtures thereof;
and further comprising

- 5 C) from 0.1 to 10.0 % by weight of one or more photoinitiators;
 and
 D) from 0 to 70% of compounds selected from the group
 consisting of solvents and
 E) from 1 to 15% of compounds selected from the group
 consisting of photosynergists, ultraviolet absorbers, hindered
 amine light stabilizers, adhesion promoters, flow aids,
 wetting aids, rheology modifiers and mixtures thereof .
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14. A process as claimed in claim 13, further comprising the step of:
 III) exposing the coating to UV radiation wherein the coating is cured
 with an irradiance level between .01 and 200mW/cm² for a time of
 between 1 second and 30 minutes to obtain a non-tacky surface.
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15. A process according to claim 13 wherein the coating is cured with an
 irradiance level of between 1 and 100 mW/cm² for a time of between 30
 seconds and 10 minutes to obtain a non-tacky surface.
- 20 16. A process according to claim 13 wherein the coating is cured with a UV
 source providing UV irradiation with UVV:UVA of 1:1 or less, UVB:UVA
 of 1:1 or less, and UVC:UVA of 1:1 or less.
- 25 17. A process according to claim 13 wherein the coating is cured with a UV
 source providing UV irradiation with UVV:UVA of 1:1 or less, UVB:UVA
 of 1:1 or less, and with substantially no UVC.
- 30 18. A process according to claim 13 wherein the coating is cured with a UV
 source providing UV irradiation with UVV:UVA of .05:1 or less,
 UVB:UVA of 0.5:1 or less, and with substantially no UVC.

19. A process according to claim 13 wherein the coating is cured with a UV source providing UV irradiation with UVV:UVA of 1:1 or less, and with substantially no UVB and UVC.
- 5 20. A process according to claim 13 wherein the coating is cured with a UV source providing UV irradiation with UVA only, and with substantially no UVV, UVB, and UVC.
- 10 21. A process according to claim 13, wherein the coating applied comprises compound A) selected from the group consisting of octyl-decyl monoacrylate, isobornyl monoacrylate, isodecyl monoacrylate, hexanediol diacrylate, tripropyleneglycol diacrylate, trimethylolpropane triacrylate, alkoxylated trimethylolpropane triacrylate, pentaerythritol triacrylate, pentaerythritol tetraacrylate pentaerythritol pentaacrylate, dipentaerythritol hexaacrylate, and mixtures thereof above.
- 15 22. A process according to claim 13, wherein the coating applied comprises compound B selected from the group consisting of urethane acrylates and methacrylates, polyester acrylates and methacrylates, melamine, acrylic amine, cellulose based acrylates and methacrylates and unsaturated polyesters and mixtures thereof.
- 20 23. A process according to claim 13, wherein the substrate to which the coating is applied comprises an automotive or other transportation vehicle.
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